

SCIENCE, 2009 COURSE OUTLINE SEMESTER 1

	Date	CONTENT	EXPERIMENTS	ASSESSMENT TASKS	Homework
1	FEB 2-6	<ul style="list-style-type: none"> expectations (assessment, rubrics) Chapter 1 - Investigating Reactions Reaction Rates (p.2) 	<ul style="list-style-type: none"> getting started (Silly Putty) p.1 tempt & Reaction Rate (p.3) 	<ul style="list-style-type: none"> Lab Report "Tempt & Reaction Rate" 	<ul style="list-style-type: none"> Check Q's (p.9)
2	FEB 9-13	<ul style="list-style-type: none"> Everyday Reactions (p.5) Speeding up Reactions (p.10) 	<ul style="list-style-type: none"> What affects the Rate (p.7) 	<ul style="list-style-type: none"> Lab Report "What affects the Rate" 	<ul style="list-style-type: none"> Check Q's (p.13)
3	FEB 16-20	<ul style="list-style-type: none"> Energy and Mass in reactions 	<ul style="list-style-type: none"> Action of Catalyst (p.11) Exothermic/Endo. Reactions 	<ul style="list-style-type: none"> Lab Reports 	<ul style="list-style-type: none"> Check Q's p.21
4	FEB 23-27	<ul style="list-style-type: none"> Law of Conservation of mass 	<ul style="list-style-type: none"> Does mass change in a Reaction? 	<ul style="list-style-type: none"> Lab Report 	<ul style="list-style-type: none"> Revision, Chapter Rev.
5	MAR 2-6	<ul style="list-style-type: none"> Chapter 3 - USING ELECTRICITY getting started p.52 Electrical Safety 	<ul style="list-style-type: none"> Short Circuits and Fuses 	<ul style="list-style-type: none"> Lab Report 	
6	MAR 9-13	<ul style="list-style-type: none"> Fuses and Circuit Breakers Earthing 	-	-	<ul style="list-style-type: none"> Check Q's (p.58)
7	MAR 16-20	<ul style="list-style-type: none"> Measuring Electricity Skill Builder p.65 	<ul style="list-style-type: none"> Ohm's Law 	<ul style="list-style-type: none"> Lab Report 	<ul style="list-style-type: none"> Check Q's p.66 + 67
8	MAR 23-27	<ul style="list-style-type: none"> Where does electricity come from? 	<ul style="list-style-type: none"> Research "Web Watch - p.75" 	<ul style="list-style-type: none"> Research Task 	<ul style="list-style-type: none"> Check Q's p.74 + p.75
9	MAR 30- APR 3	<ul style="list-style-type: none"> Saving Electricity "Assessment Task 3" 	from the Teacher Resource Book	<ul style="list-style-type: none"> "Assessment Task 3" 	<ul style="list-style-type: none"> attached app. 1
10	APR 6-10 (Good Friday)				<ul style="list-style-type: none"> Revise Chap 3
11	APR 13-17 (Anzac Day Holiday on Friday)				<ul style="list-style-type: none"> and finish off Assessment Task 3
12	APR 20-24	Test on Chapter 3		<ul style="list-style-type: none"> Test Chapter 1 	

INVESTIGATING REACTIONS

USING ELECTRICITY

TERM 1

	Date	CONTENT	EXPERIMENTS	ASSESSMENT TASKS	H/W
13	APR 27- MAY 1	Chapter 5 - How Cells Work • Getting started • Cells and Cell Growth	• Calibrating a microscope • Sizes of cells	• Lab Report	
14	MAY 4-8	• Cell division • Cancer			check Q's p. 112
15	MAY 11-15	• Cell processes -	• Activity P. 116 • Muscles and Exercise	• Lab Report	check Q's p. 118
16	MAY 18-22	• Assessment Task 5 - CANCER from the Teacher Resource Book (Attached app. 2)		" Assessment Task on Cancer	
18	MAY 25-29	• Photosynthesis • How materials get into cells	• Observing Chloroplasts	• Lab Report	check Q's p. 124
17	MAY 31- JUN 5	• Osmosis • Chapter Review	• Osmosis	• Lab Report • Test	• Revision
18	JUN 8-12	• Chapter 4 - LIVING WITH • Getting started • Microscopic Life	• Microscopic Life in pond water	• Lab Report	
19	JUN 15-19	• Bacteria • helpful Microbes	• Growing Microbes p. 83	• Lab Report	check Q's p. 85
20	JUN 22-26	• Microbes and Diseases	• Controlling Bacterial Growth	• Lab Report	check Q's p. 91
21	JUN 29- JUL 3				
22	JUL 6-10				
23	JUL 13-17	Assessment Task 4 from the Resource Book (Attached App. 3)		• Assessment Task "Diseases"	Research Assignment
24	JUL 20-24	• Chapter Review	• Web Watch (p. 99) Hepatitis	• Test	Revision

WORK

TER 3

HOW

LIVING WITH MICROBES

TER 3 2

TER 3 3

	Date	CONTENT	EXPERIMENTS	ASSESSMENT TASKS	H/W
25	JUL 27-31	Chap 8 - LIVING WITH ACIDS AND BASES Getting Started - What are acids?	Red Cabbage Indicator	Lab Report	Check Q's p.180
26	AUG 3-7	pH scale	Measuring pH Activity on p185 p188 - TRY THIS	Lab Report	Check Q's p.187
27	AUG 10-14	Reactions of Acids and Bases	Reactions of ACIDS	Lab Report	Check Q's p.195
28	AUG 17-21	Salts Acid Rain	Antacid	Lab Report	Revision Review Q's Check Q's on p33
29	AUG 24-28	Assessment Task 8 from the Teacher Resource (App. 4)		"ACID RAIN"	
30	AUG 31 SEP 4	Review Test			
31	SEP 7-11	Chapter 2 - LIGHT AND SOUND Getting Started Properties of Light and Sound	Reflection	Lab Report	
32	SEP 14-18	Refraction How the eye focuses light	Lenses and Light	Lab Report	
33	SEP 21-25				
34	SEP 28 OCT 2				
35	OCT 5-9	Assessment Task 2 from the Teacher Resource (App 5)	"Making an Optical Device"	Optical Device	
37	OCT 12-16	Why things are coloured Sound Waves	Colours	Lab Report	Check Q's p42

BASES

ACIDS AND

LIGHT & SOUND

TERM 3

tt/w.

Review Q's

check Q's
p 207

check Q's p 212

Activity p. 218

check Q's p. 224

• Review Q's
• Assessment Task

38	OCT 19-23	• Light Waves • Chapter Review		Test
39	OCT 26-30	Chapter 9 - The Changing Earth • Getting started • Life in the past	• Making Moulds and Casts	- Lab Report
40	NOV 2-6	• Australia's history	• Activity p. 206	
41	NOV 9-13	• Earth Movements (folds & Faults)	• Earthquake Waves	• Lab Report
42	NOV 16-20	• The Richter Scale • Earth Plates	• fig 56 Collapse of continents	
43	NOV 23-27	• Assessment Task 9 "Dinosaurs and megafauna"	(APP 8) from the Teacher Resource	• Test • Dinosaur Task
44	NOV 30-DEC 4			
45	DEC 7-11			
46	DEC 14-18			

2-5-8-3

(PASTE INTO YOUR WORKBOOK)
Y9 - LIVING WITH MICROBES

EXPT - GROWING MICROBES (p83)

Aim: To observe the growth of microbes on agar plates

Materials

- 4 sterile petri dishes containing nutrient agar
- sterile cotton bud
- adhesive tape
- sterile forceps
- marking pen
- soap for washing hands
- paper towel
- disposable gloves (optional)

Wear safety glasses.

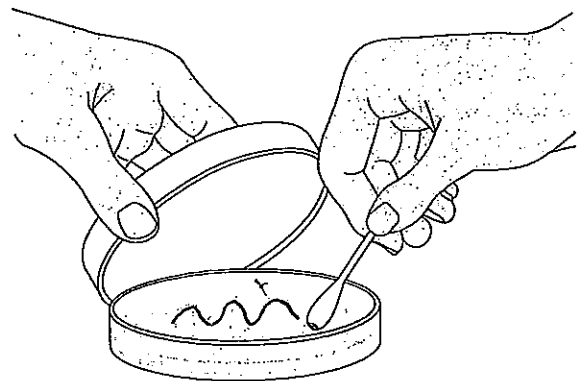


Planning and Safety Check

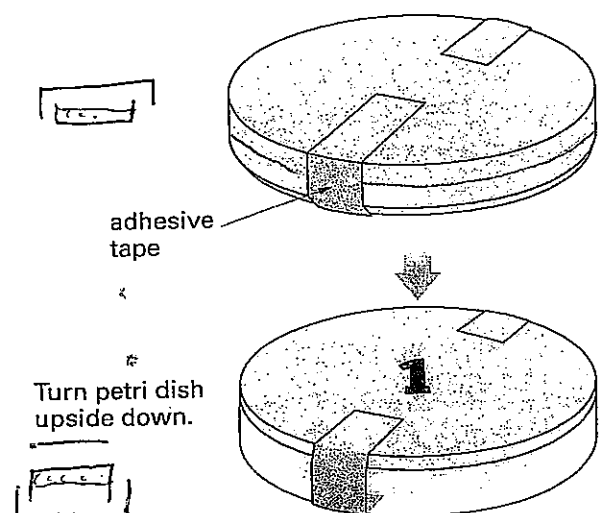
- There are some very important safety issues to be aware of in this investigation. Carefully read through the Method and the other points in this Planning and Safety Check before you start.
- You should always wash your hands with soap and water before handling agar plates, as well as after the investigation.
- Because harmful bacteria could grow in the petri dishes, you must not lift the lids of the petri dishes until you are ready to use them. After use they must be sealed with adhesive tape.
- The dishes will be put in a warm dark place below about 30°C. If an incubator is available, do not set it above 30°C. This will minimise the growth of bacteria, such as *E. coli*, which are harmful to humans.
- When you have finished the experiment, put the petri dishes in the container provided by your teacher. Do not throw them in the waste bin.
- The jelly-like agar in the petri dishes contains moisture and nutrients (similar to beef broth) which the micro-organisms use as food.
- Prepare a full-page data table for your observations in Method Step 9.

Method

- 1 Take a cotton bud out of its wrapping and rub it over a desk or the floor.
- 2 Raise the lid of one petri dish and rub the cotton bud over the surface of the agar as shown below.

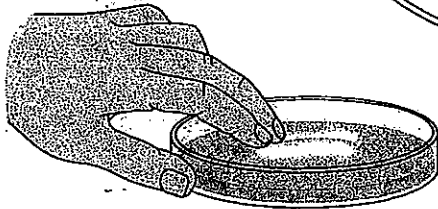
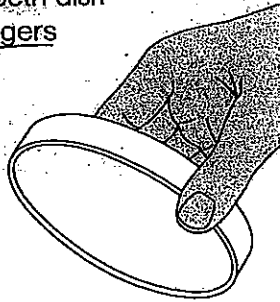


- 3 Immediately put the lid back on the petri dish. Tape the lid on with adhesive tape.
- 4 Turn the petri dish upside down and label it number 1. (This stops water drops from forming under the lid and falling on the agar.)



- 5 Use forceps to rub a dead insect or some dead grass over the agar in the second petri dish. Tape the lid on, turn it upside down, and label it number 2.

- 6 Open the lid of the third petri dish and lightly stroke your fingers across the surface of the agar. Tape the lid on, turn it upside down, and label it number 3.




Lightly stroke the surface of the agar.

- 7 The fourth petri dish is the **control**. Don't open it. Tape the lid on, turn it upside down and label it.

A control is used to compare any changes that you observe in the other dishes with those that occur in your control dish. A control is a comparison.

- 8 Leave the dishes turned upside down in a warm, dark cupboard. Check them each day for the next five days. **DO NOT REMOVE THE LIDS.**

- 9 Read the information on the growth of microbes in the box below. Then prepare a full page data table for your results. It should include space for a sketch of each dish and a description of the colonies.

 Record the growth in the petri dishes each day. Sketch the four dishes and show the number, sizes, colour and texture of the colonies.

Discussion

- 1 Which petri dish contained the fastest growing or largest colonies? Suggest a reason for this.
- 2 In petri dish 1, do the microbes grow only on the places which were rubbed with the cotton bud? Why do you think this happens?
- 3 What was the reason for including petri dish 4 in the experiment?
- 4 Which type of microbe colony became visible first—bacterial or fungal? Did this happen in each dish?
- 5 Do you think that the bacterial and fungal colonies would keep on growing in the dishes? Give a reason for your answer.
- 6 Predict how the results for dish 3 would be different if you had washed your hands before touching the agar.

ANSWERS

1)

2)

3)

4)

5)

6)

DISCUSSION

CONCLUSION

Chapter 4 - LIVING WITH MICROBES

p78

A) 1) Read "Getting Started"

2) Discuss the solution to the problem with your neighbour in class

3) WRITE your inferences and the tests you might use to solve the problem into your workbook.

B) MICROSCOPIC LIFE (p. 79)

Write the following into your workbook

"Microscopic organisms were first _____ just over 300 years ago. We call microscopic organisms micro-organisms or "microbes"; and to observe them you need a _____

Most microbes belong to the _____ and _____ kingdoms. But some microscopic fungi such as _____ and _____ are also classified as microbes.

C) PROTISTS (Answer these Q's in your workbook)

Q1) Where do the protists live?

Q2) What is meant by plant-like protists? explain.

Q3) What is meant by animal-like protists? explain

Q4) Describe the structures on the outside of the cell (protist) which help ~~the~~ to move through the water.

Draw these structures,

D) Large Protists. (p. 79)

Describe the large Protists in your work-book.

E) List the names of micro-organisms on p. 81 under Algae, protozoans and microscopic animals.

F) EXPERIMENT PAGE 80 (we'll do the expt. later) "MICROSCOPIC LIFE IN POND WATER"

1) Write out the title

2) " " " AIM

3) Read the method

4) Leave space for RESULTS

(i.e. - organisms found in pond water
(identified from p. 81).

5) Write out the 3 Qs in the
"DISCUSSION" and leave space for
ANSWERS

6) Write "CONCLUSION"

Leave space for "conclusion"

7) DISCUSSION (leave space)

(i.e. suggestions on improvement
etc).

G) BACTERIA. (p. 82)

Summarise p. 82

H) WRITE OUT (p. 83 p. 84)

exp. "GROWING MICROBES"

as ~~part~~ outlined in (F) above

(We'll do the expt.)

(I) Explain "Growth of Microbes", on p. 84

(J) DO THE Check Questions on p. 85
(Qs. 1-6)

WORKSHEET-2-19-Chapter 4

p. 86

4.2 - HELPFUL MICROBES

1) What sort of roles do bacteria play in the environment and in making foods?

2) Decomposers

* Explain what happens to an organism when it dies step by step.

* Draw fig 19 into your workbook

3) WRITE OUT "Activity - p 87 (Blue section) Decomposing Bread" section into your workbook. Leave some space for the observation and question indicated by the notebook (Clipboard) symbol.

4) p. 87 + p 88

Making Foods

* Explain how a cheese is made using bacteria (eg - blue veined cheese) (fig 21)

* Explain how yoghurt is made using bacteria (fig 20)

* Explain fermentation and how it is used in making foods (wine & bread)

Q 5) Explain how the microbes in the human body make the vitamins

Q 6) Explain how cows digest the cellulose.

5.88 STOPPING THE DECAY OF FOOD

Q 7) List the ways of stopping the decay of food.

p. 89

Q 8 Explain pasteurisation.

p.89

Q9 Explain how heat sterilisation kills microbes.

Q10. What does cooling food do to the food decaying?

Q11) Explain how freezing stops the decay of food

p.90

Drying

Q12) Explain "drying" as a form of preserving food.

Q13) Explain "adding chemical preservatives" to household substances to preserve them.

IRRADIATION

Q14) p.91

Explain "Irradiation" as a process to kill micro-organisms.

Q14) Why is irradiation not used in Australia?

Q15) Do THE "Check" Q's on p.91+92

FINISH OFF THE SHEET
+

DO "THE SUPERMARKET SURVEY" ON p.90
"Activity section")

by 14th JULY

p. 93

1) Read the "Activity" and discuss the questions and write the answers into your Workbook.

2) Causes of Disease

What is a disease?

3) What're infectious diseases?

4) Describe how the infectious diseases are caught

5) What do the microbes do to your body once they are in?

Viruses

6) What are viruses? Are they a living organisms?

p. 94

7) Why are viruses classified as "parasitic organisms"?

8) Describe how insects spread viruses from one organism to another.

9) Describe the disease rabies.

10) a) Draw fig 32 into your workbook

"How a virus reproduces inside a cell"

(p95) b) Draw the table showing the diseases caused by mi

11) Read "Science in Action" on

Finding the cause of cholera

and answer the questions 1-4 based on the text.

12) Fighting Disease

Describe the first line of defence against invading microbes.

13) Describe the body defences after the microbes penetrate the skin (phagocytes)

p.96

- 14) Describe the composition of blood (plasma, red blood cells, white blood cells)

ANTIBODIES

- 15) How do the antibodies attack the bacteria? Draw fig 36 to support your explanation.

p.97

Controlling Infections

- 16) Explain each of the following ways of controlling disease-causing microorganisms in detail.

- a) Immunity and vaccination (read the "Science bits" for further information)
- b) Disinfectants and antiseptics.

p.99

- c) Hygiene
- d) Isolation
- e) Antibiotics

- 17) Read the blue section "Glandular Fever" and summarise it

- 18) Read the green section "Hepatitis"

- 19) Go to www.scienceworld.net.au web address and find the information on hepatitis A, B and C and answer the questions 1-2 and 3.

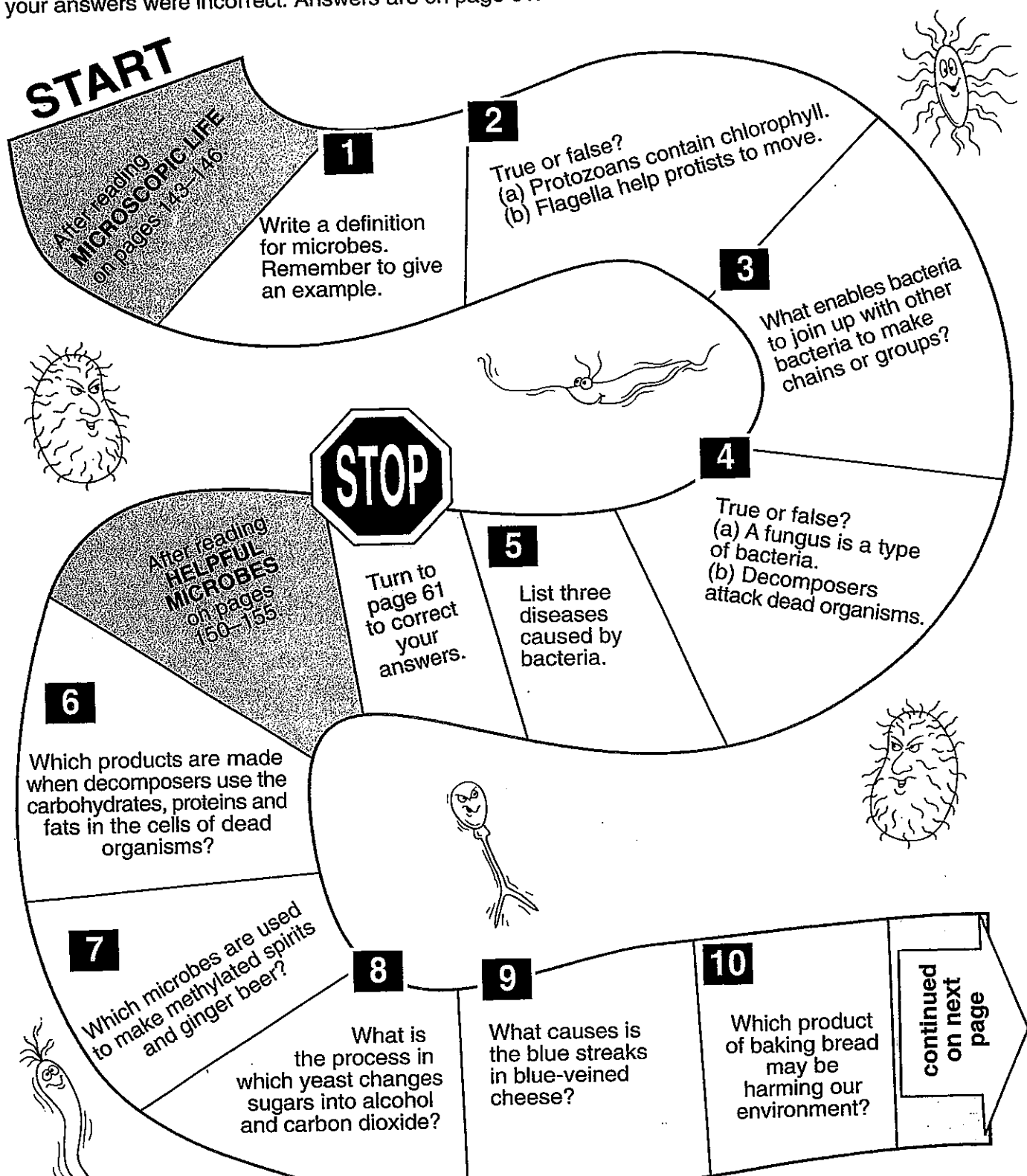
- (p.98) 20) WRITE UP The expt. "Controlling Bacterial Growth" into your workbook by leaving space for answers to the questioning/discussion, conclusion. Don't forget to include the "AIM" and the Method.

DURING READING

Exercise 4 Recalling information

(After reading the whole chapter)

Follow the directions on the path and answer the questions on a separate sheet of paper. Do not continue on your journey after each STOP sign unless all your answers are correct or you know *why* your answers were incorrect. Answers are on page 61.



FINISH

Turn to page 61
to correct your
answers.



25

How can your
body be
'tricked' into
preventing
disease?

24

(a) How can cholera be
prevented?
(b) How can the spread
of chicken pox be
prevented?

23

What is the difference
between an antiseptic
and a disinfectant?

22

Name two
ways in which
white blood
cells can
destroy the
measles
virus?

21

What is pus
made up of?

20

What prevents
harmful bacteria
growing in the
stomach?

19

What
prevents
harmful
bacteria from
infecting the
skin?

18

True or false?
(a) Viruses can
infect bacteria.
(b) Viruses are
smaller than
bacteria.

17

What can
viruses do
that living
things
cannot do?

16

Name three
diseases **not**
caused by
microbes.

15

List three ways
in which
infectious
diseases can
be caught.

After reading
**MICROBES AND
DISEASE** on
pages 157-162.

Turn to
page 61 to
correct your
answers.

14

List six ways
in which
vegetables
can be
preserved.

13

List three
ways in
which meat
can be
preserved.

12

Which word
means 'to
keep in the
same
condition'?

11

Why is the
amount of
vitamins in
your blood
reduced
when you
take
antibiotics?

continue
here



VIRUSES

1. Complete the table:

Five main points about <i>Viruses</i>	Examples of diseases caused by <i>viruses</i>
<ul style="list-style-type: none">▪▪▪▪▪	

2. Look at the diagram describing how viruses reproduce. Using a flow chart, with **words only**, describe the sequence of events that take place.

3. What are the conditions in your body that are ideal for virus reproduction?

4. Describe one feature of the influenza virus that enables it to cause harm to the cells in your body.

BACTERIA

1. Complete the table

Five main points about <i>Bacteria</i>	Examples of diseases caused by <i>Bacteria</i>
<ul style="list-style-type: none">▪▪▪▪▪	

2. Describe one difference between bacteria and viruses

3. Do all bacteria cause diseases? Explain

4. Draw a diagram of an *E.Coli* bacterial cell. Label the flagella

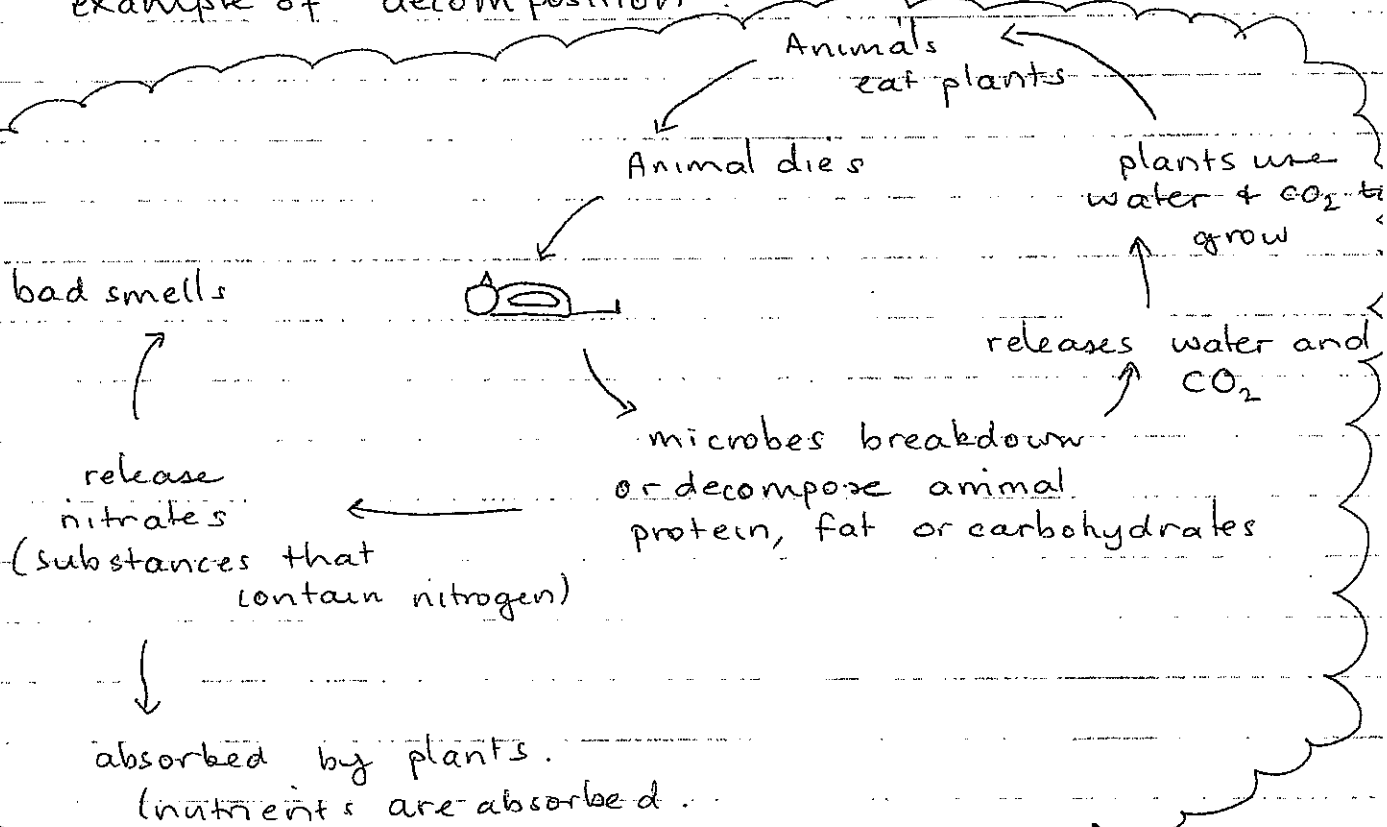
5. How do bacteria cause damage to your body?

15/7/08

Helpful microbes - microbes that help us in our everyday life. There are 3 main ways that they can be helpful.

① They decompose vegetable & animal matter

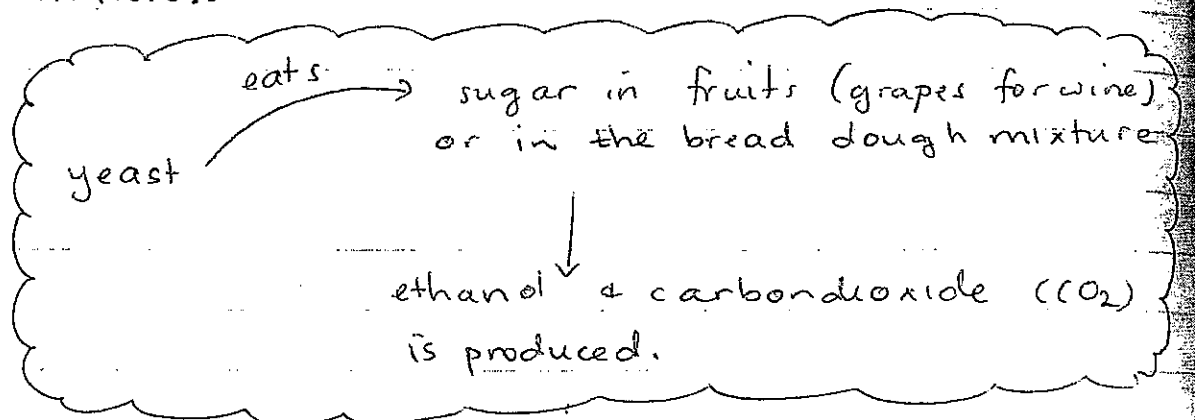
They clean up the waste products and remnants (what remains) of dead organisms (plants or animals) by decomposing them. Composting is an example of decomposition.



② They help to make different foods

- Bacteria are used to make cheese and yoghurt
- Mould is used to make blue cheese.
- Yeast (fungi) is used to make bread & wine/beer in the process of FERMENTATION.

FERMENTATION...



ethanol - in bread this evaporates when dough is cooked in the oven

- in wine, the ethanol remains and makes the wine alcoholic (ethanol is alcohol)

CO_2 - enables bread to rise (bubbles of CO_2 in the dough make the bread fluffy + soft in texture)

- in alcoholic drinks CO_2 makes the drink bubbly or sparkly.

③ They help to digest food in the gut + they make important vitamins for us (in our gut)



- Bacteria is present in our gut + help to digest our food
- They also produce vitamins for us that we can't produce ourselves
- Bacteria are present in the gut of cows. Here they breakdown cellulose. Cellulose is a carbohydrate found in all plants, including the grass that cows eat.

16/7/08

stopping the decay of food ("going off")

A lot of fresh vegetables, fruits and meat enters our food markets (comes out of farms) everyday - too much for us to consume, or eat before it decays, or goes off. Therefore to prevent wasting of food, and to allow us to have quick, reliable access to all types of food, this fresh produce, some of it, is preserved. This enables food to be left for sometime before it is eaten.

There are a number of different methods of food preservation. Some of them are shown below in the table:

Method of Preserving	Example of Food. (+ Picture)	Description of method of preserving
Heating - sterilisation	canned, bottled food. 	Food is heated under high pressure at 120°C for 15 minutes. This kills all microbes in the food & their spores.
Heating - pasteurisation "Louis Pasteur"	Milk 	Milk is heated to 72°C for 15 seconds then cooled to below 10°C . (If milk was heated to 120°C & sterilised, this would destroy the 'goodness' & nutrients in milk, such as milk proteins.)

Method of preserving
~~Drying~~

Drying

Example of
food (+ picture)

Dried fruit (Chaunang
chips, raisins)

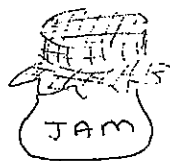


Description of method
of preserving.

Drying removes
water from the
food. Microbes
need water to
grow + reproduce.
Food is dried in
the sun.

Adding chemical
preservatives

Jam,
olives, honey,
pickled onions.



~~A~~ Sugar and
salt are
chemical
preservatives.

Foods with high
sugar or salt
content prevent
microbes from
growing.

Jam + honey can
be stored at room
temp. for a long
time.

Acids, like vinegar
are also preservatives.
Pickling foods with
vinegar kills
microbes.

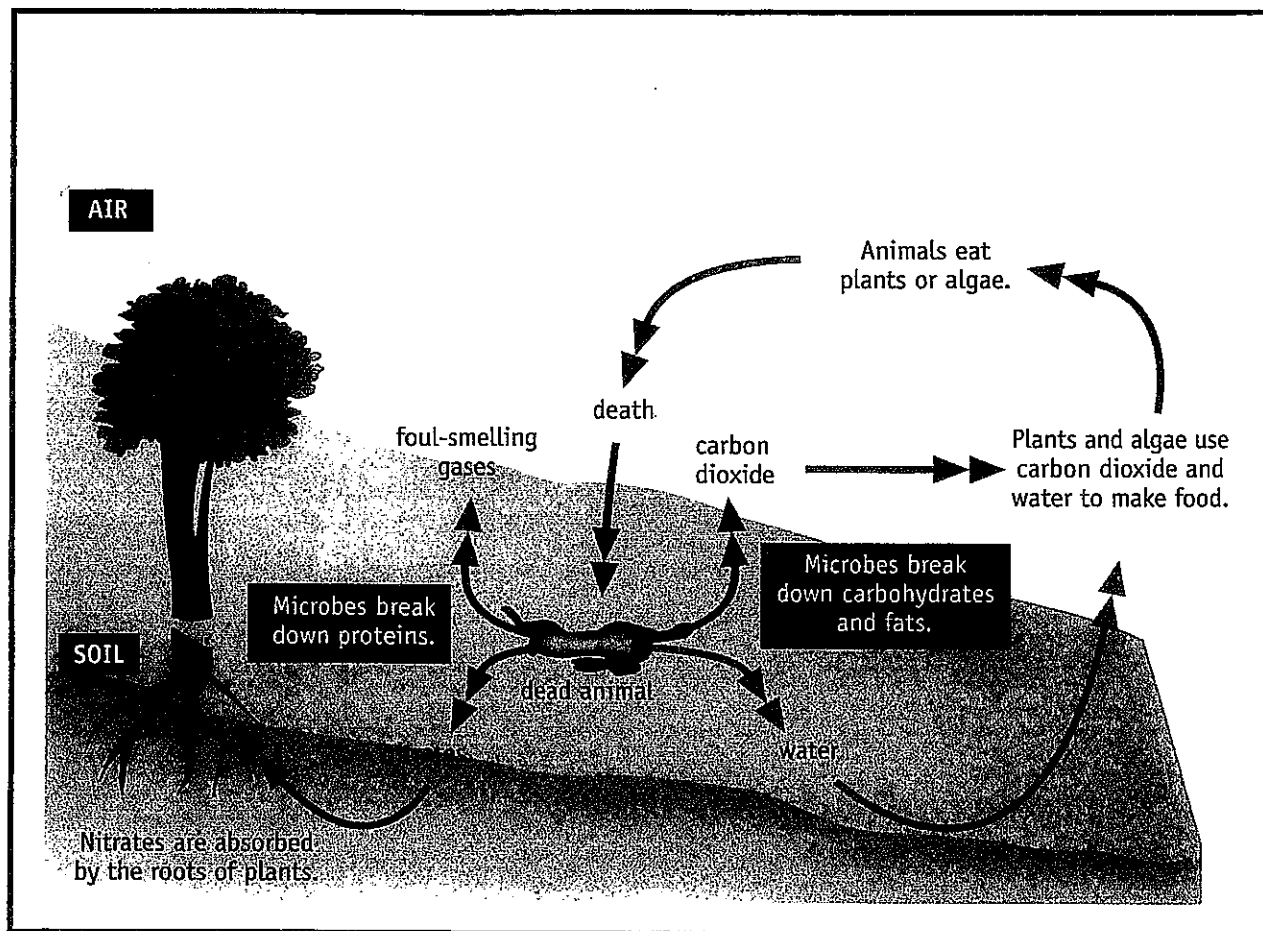
Irradiating

Medicines

Microbes are killed
by radiation.
Medicines are sterilised
in this way.

WHAT DO YOU KNOW ALREADY?

Exercise 3 Understanding diagrams



Authors often use diagrams to illustrate the text. Most diagrams use basic sketches, with labels and arrows to illustrate a process. Examine the Figure above carefully and then answer the following questions.

1. When an animal dies, what are the four substances released?
2. What happens to the carbon dioxide?
3. What happens to the nitrates?
4. Which product is the only substance not recycled?
5. List the three substances which are broken down by microbes.

102

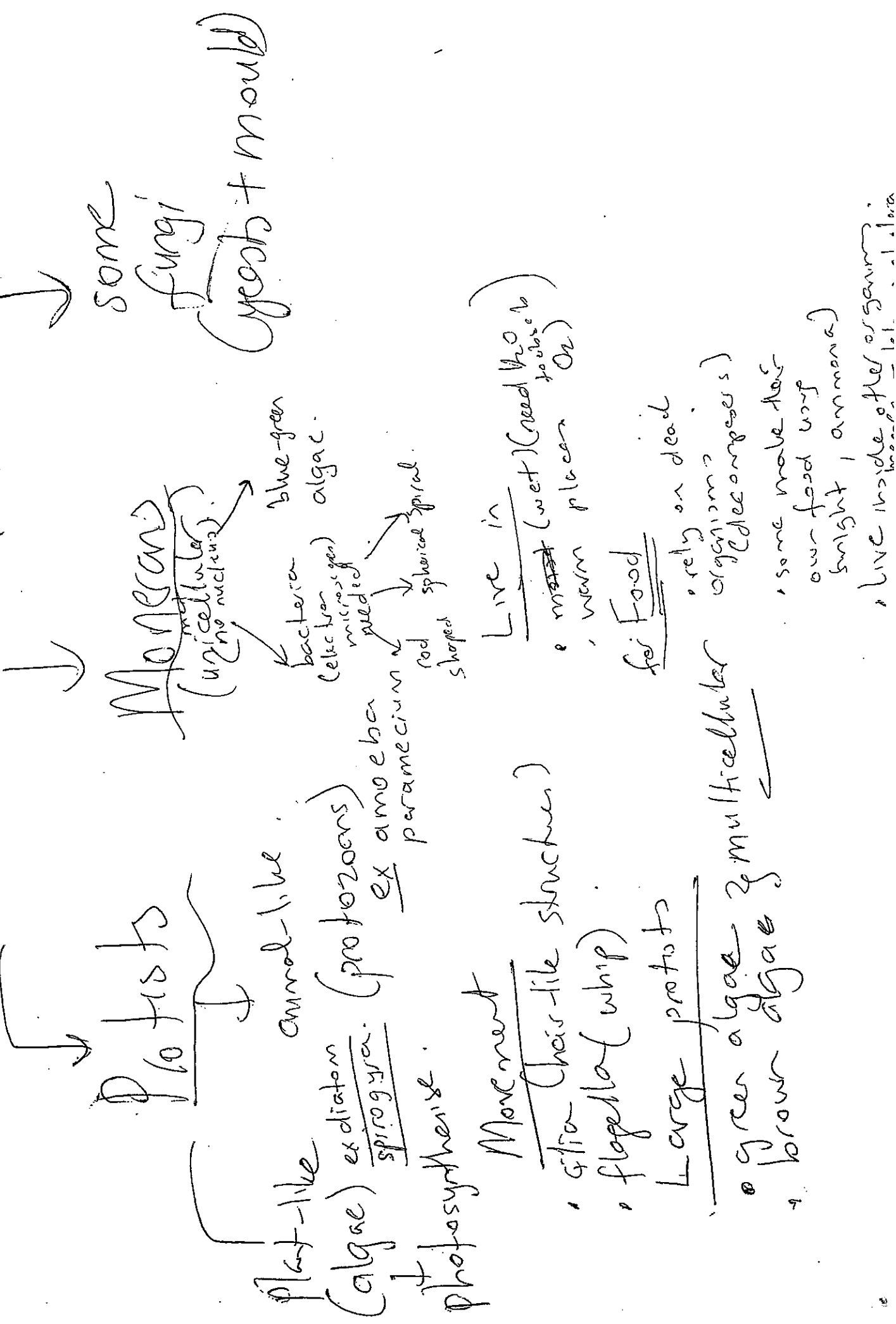
10-185

clean, healthy practices																
										single celled fungi which ferment sugars						
										innoculation with vaccine to produce immunity						
										microbes which are smaller than bacteria and are parasitic						
process of living by g cold																
										proteins in the blood which attack microb their toxins						
monerans which cause diseases eg. tetanus																
										to use a substance again and again						
														breaking d bacterial or action into chemicals		
any microscopic organisms																

Key word _____

①

Microbes (microorganisms)



Live in (wet) (need ^{to live} to live)

• moist, warm places

for Food

• rely on dead organisms (decomposers)

• some make their own food using sunlight, ammonia, live inside other organisms

Movement

- glia (hair-like structures)
- flagella (whip)

Large protists

green algae, brown algae, multicellular algae

helpful

(recycle matter)

Decomposers

↓ give complex molecules in
breaks food into
smaller ones
such as CO_2 , H_2O ,
Nitrates

↑ food
essentially
carbohydrates
+ protein

dead
organisms

protein

nitrates

plant absorb

plants algae
+ mushrooms

animal
eat plants
also

Microbes

make
foods

cheese

(mould) (yeast)

ex blue-veined
cheese

bread

change sugars
to alcohol
+ CO_2

wine

yeast

change sugars
to alcohol
+ CO_2

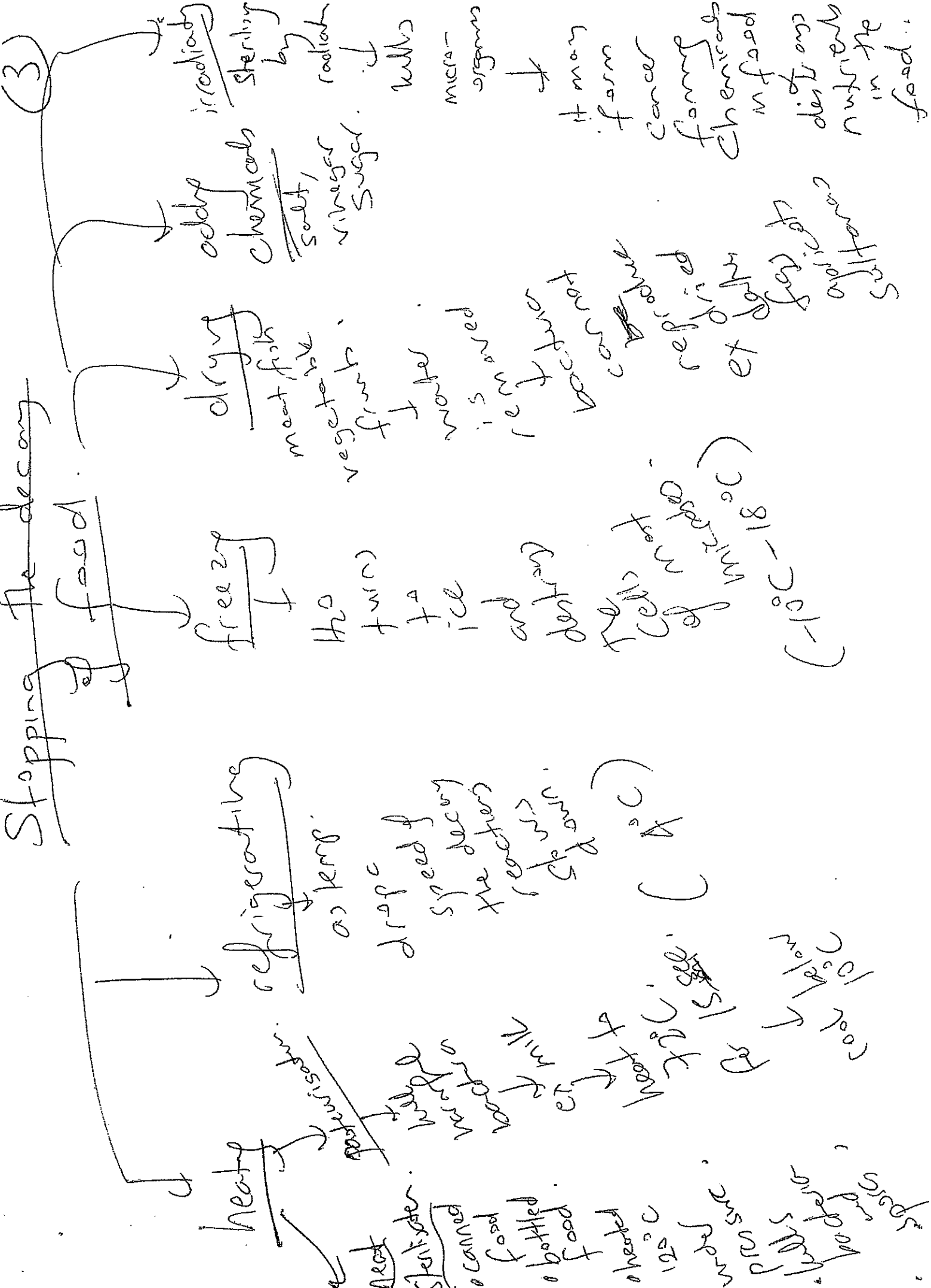
more yoghurt

(bacteria)

feed on sugar
in milk
and turn it
to yoghurt

In the gut
↓
animal
digestion
↓
Vitamin
are produced
in the gut
by bacteria
in the gut
↓
plant absorb

Stopping the decay of food



Microbes and Disease Cause

Infectious diseases

caught by

breathing in the air containing the microbes

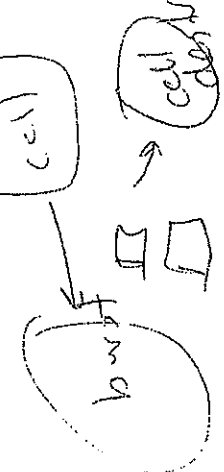
skin contact with the infected person

ex measles
chickenpox
cold, tetanus
ringworm
breath
re
the
drops
needles
surgery
contaminated
instruments
or person

Viruses

- * Small
- * not made up of cells
- * can form crystals like non-living matter
- * parasitic (can only live in or on another organism)
- * smaller than bacteria
- * spread in insects

spread bacteria ex cold rubella



bacteria

- * tetanus
- * cholera
- * pneumonia
- * botulism
- * tuberculosis
- * syphilis
- * gonorrhoea
- * food poisoning (botulism)

fungi

- * ringworm
- * thrush
- * athlete's foot

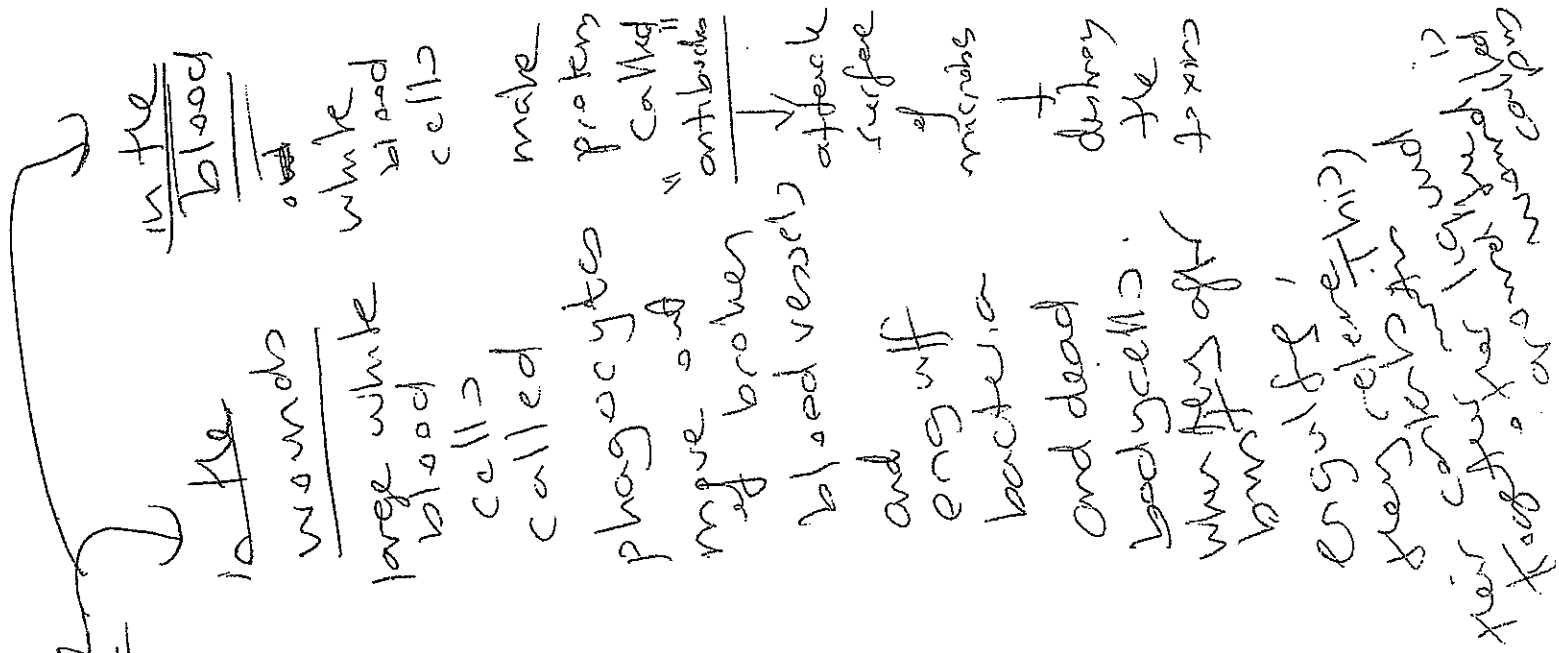
protozoa

- * malaria
- * amoebic dysentery
- * sleeping sickness

- * cold rubella
- * measles
- * chickenpox
- * warts
- * cold sores
- * polio
- * rabies
- * dengue
- * herpes

5

Fighting Disease



SKIN
(1st line of defence)
• sweat (salt and acids)
kill the microbes.

nose & mouth.
• cell lining,
produce liquids
as ~~protection~~ ^{protection} which
the microbes if
they pass into
stomach,
strong acid
in the
stomach
kills
the microbes.

6

Immunity and Vaccination

immunity to a certain disease is due to mainly to the presence of antibodies in the blood.

- inject dead microbes or treated toxins into your blood by a vaccination.
- while blood cells make antibodies and destroy them.

other antibodies remain in your blood and protect you in the future.

Controlling Infections

Disinfectants

kills bacteria on objects
ex bleach

Antiseptics

kill bacteria on the skin.
alcohol
iodine
soap
detergents

Hygiene

untreated food
human waste
ex cholera
cholera
typhoid
hepatitis

Isolation

chicken pox
measles
stay home + stay away from uninfected people.

Antibiotic

- substances that actually stop growth of bacteria.
- produced by microbes, by fungi, penicillin, tetracycline, streptomycin, etc.

antibiotics
antibiotics
antibiotics
antibiotics
antibiotics

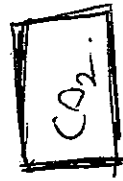
summary
of w/s 1 + 2

Decomposers

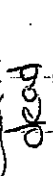
- * Breaks complex molecules into smaller ones such as CO_2 , H_2O and nitrates.

copy fig 19,

air



soil



dead

organism

Helpful Microbes

Bacteria in the gut

in humans

- vitamins are produced in intestine by bacteria in our body.

in animals
Such as

Cows, sheep

- digest cellulose by bacteria

MAKING FOODS

bread

yeast + sugar
change to CO_2 and ethanol

cheese

ex blue-veined cheese

wine/beer

yeast + sugar
ferment and produce CO_2 and ethanol

yoghurt

bacteria feed on sugar in milk and turn it into yoghurt

STOPPING THE DECAY OF FOODS

Heating

heat sterilisation

- Canned food
- bottled food
- heated to 120°C under pressure
- kills bacteria and spores

ex fin. food
(peas, beans, Soup, sauces)

Pasteurisation

- kill harmful bacteria by heating to 72°C for 15 sec. and then cooling below 10°C

ex - Milk

Refrigeration

- Dropping the temperature down to 4°C , speed of decay reactions slows down.

Freezing

- H_2O turns to ice and destroys the cells of most microbes (-10°C to -18°C)

Drying

- ex meat, fish, fruit, vegetables
- when H_2O is removed bacteria cannot reproduce

adding chemicals

- high concentration of sugar and salt stops the reproduction of bacteria

Irradiating!

- kills micro-organisms
- it may form cancer forming chemicals in food
- destroys nutrients in the food.

CONTROLLING BACTERIAL GROWTH

You have probably seen many advertisements like these ones on TV. The makers of the products like to emphasise the importance of 'scientific tests' and 'new powerful active ingredients' in selling their product.



Your aim is to plan and carry out an experiment to test the effect of disinfectants and antiseptics on bacterial growth.

What is a disinfectant? _____
What is an antiseptic? _____

You will be allocated a group of about 4 to conduct the experiment. Write you team member's names in here.

1. _____
2. _____
3. _____
4. _____

Materials (for the group):

- Required number of lab coats
- 2 petri dishes (with agar)
- cotton swabs
- 2 types of disinfectant or antiseptic solution
- 4 small pieces of filter paper (no bigger than a 5 cent piece). Cut 2 into a square and 2 into a circle
- tweezers
- small dishes

Method: Make sure you follow these steps carefully.

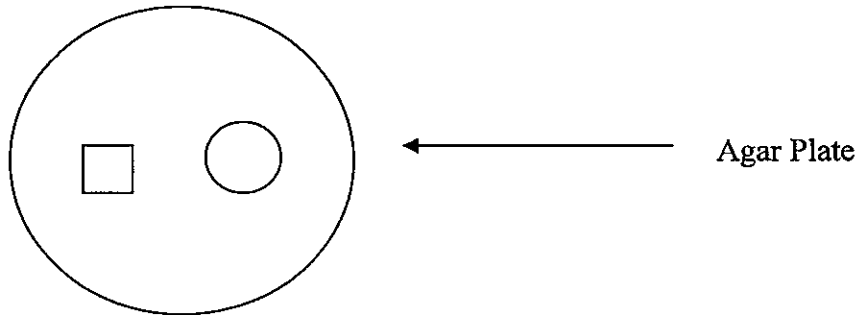
1. Collect all materials.
2. Cut the 4 small pieces of filter paper. Place the cutouts in the small dish. Coat both the square shapes in either a disinfectant or an antiseptic. Write which one you have chosen here: _____

Coat both the circle shapes in a different antiseptic or disinfectant. Write which one you have chosen here: _____

3. Collect some swabs from either the desk, floor, bottom of your shoe, door handle etc. Write in here where you took your swab from: _____

4. Rub the cotton swab over the agar plate. Make sure you cover most of the surface area.

5. With the tweezers carefully pick up the square shaped filter paper, and place it on one side of the agar plate. Do the same with the round piece of filter paper.



6. Tape up your dish, and turn it upside down. Borrow a white board marker from Miss. Niklaus and write on this plate "EXPERIMENTAL"

7. Your next agar dish is a control. This means you are NOT going to expose it to any microbes, but you will still place the square and circle onto the agar.

8. Tape up your dish, and turn it upside down. Borrow a white board marker from Miss. Niklaus and write on this plate "CONTROL"

Pack up your equipment and return to your seat.

CHAPTER 4 LIVING WITH MICROBES

Name:

Date:

Class/Group:

*Instructions to students: write answers in spaces provided.***Multiple choice questions** $(7 \times 2 = 14 \text{ MARKS})$

TOTAL 14 Marks

 $\frac{+41}{55} \text{ MARKS}$

- 1 Microbes do NOT usually include:

A protozoans.
B algae.
C water fleas.
D bacteria.

Answer: ____

- 2 A food which is NOT normally preserved by freezing is:

2

A ice cream.
B fish.
C whole fruit.
D whole vegetables.

Answer: ____

- 3 Which one of the following foods is NOT produced with the help of microbes?

2

A Lemonade
B Beer
C Bread
D Cheese

Answer: ____

- 4 Bacteria can be different shapes but NOT:

2

A rods.
B spheres.
C cubes.
D spirals.

Answer: ____

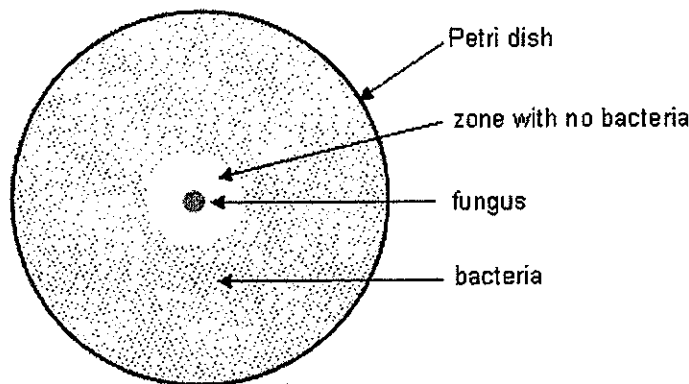
- 5 You are helping your uncle with his 'home brew' in the shed and have to decide on the best conditions for the yeast to grow to produce the beer by fermentation. You would suggest:

2

- A 30°C and some sugar.
- B 30°C and no sugar.
- C 60°C and some sugar.
- D 60°C and no sugar.

Answer: ____

- 6 A scientist was growing some bacteria on agar in a Petri dish and noticed a zone containing no bacteria around a small colony of fungus as shown in the diagram below. 2



From this she could infer that:

- A the fungus killed all the bacteria.
 - B the bacteria would not grow in the zone.
 - C something produced by the fungus killed some of the bacteria.
 - D something in the agar killed the bacteria.
- 7 A phagocyte is a cell in the body which helps to fight disease by: 2
- A producing chemicals called antibodies.
 - B producing chemicals called toxins.
 - C reproducing inside microbes that cause disease.
 - D engulfing and destroying microbes that cause disease.

Answer: ____

Short answer questions (41 marks)

Marks

- 8 Diseases may be caused by different types of microbes including **bacteria**, **viruses**, **fungi** and **protozoa**. For each of the following diseases indicate which type of microbe is the cause. 7

- (a) Tetanus _____
- (b) Athlete's foot _____
- (c) Malaria _____
- (d) Chicken pox _____
- (e) Pneumonia _____
- (f) Common cold _____
- (g) AIDS _____

- 9 Common methods of food preservation include **heat sterilisation** (heating and sealing), **refrigeration**, **freezing**, **drying** and using **chemical preservatives**.
For each of the following foods in supermarkets, decide which method is most often used.

4

- (a) Cheese _____
- (b) Gherkins (bottled cucumbers) _____
- (c) Loose apricot halves _____
- (d) Fruit pieces in a can _____

Long answer questions**Marks**

- 10 **Heat sterilisation** (heating and sealing) is a common method of food preservation.
Write a paragraph containing a sentence giving an **example** of a food which is preserved in this way and another sentence to **explain why** the method is effective.

3

Answer: _____

- 11 **Refrigeration** is a common method of food preservation.

3

Write a paragraph containing a sentence giving an **example** of a food for which refrigeration is the only or main method of preservation, and another sentence to **explain why** the method is effective.

Answer: _____

- 12 **Freezing** is a common method of food preservation.

3

Write a paragraph containing a sentence giving an **example** of a food which is preserved in this way and another sentence to **explain why** the method is effective.

Answer: _____

- 13 **Drying** is a common method of food preservation.

3

Write a paragraph containing a sentence giving an **example** of a food which is preserved in this way and another sentence to **explain why** the method is effective.

Answer: _____

- 14 Chemical preservatives are commonly used to preserve food.

3

Write a paragraph containing a sentence giving an **example** of a food which is preserved in this way and another sentence to **explain why** the method is effective.

Answer: _____

- 15 Suppose that a few cases of a mysterious infectious bacterial disease are discovered in a small city in Australia. People who are affected develop large festering boils all over their bodies and have violent convulsions which can be fatal. You are the local doctor and have to decide what to do in order to treat the victims and stop the spread of the disease. Write FOUR separate paragraphs each discussing one particular thing you would do.

8

Answer: _____

- 16 Below are sketches made of microbes which have been collected from pond water, observed through a good microscope, and labelled according to type. They are not drawn in any particular order, and are only drawn approximately to size.

* 7

Your task is to describe each organism (include ; nucleus, shape, cells joined together, cilia, flagellate, name given to organism etc)

Amoeboid:

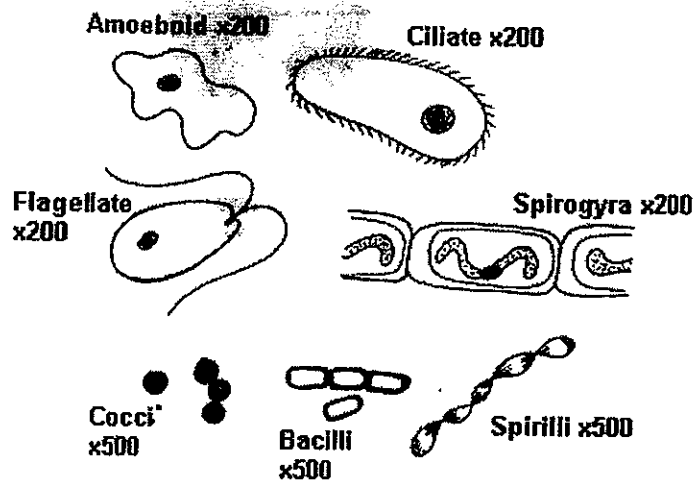
Ciliate:

Flagellate:

Cocci:

Bacilli:

Spirilli:



Evaluation / Reflection of UNIT
MICROBES

1) 3 things you'll not forget;

2) 3 things you've had some difficulty with

3) Any other comments you'd like to share? ?